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ABSTRACT

The National Institute of Education (NIE) Conference on Studies in Reading, held in 1974, featured ten panel discussions, each focusing on a designated topic related to reading. This publication reviews the reports of recommended research and development activities produced by the panels for the following topical areas: semantics, concepts, and culture; the way in which readers extract meaning from texts; attention and motivation; modeling the reading process; assessment of reading comprehension; application of existing reading comprehension research; reading comprehension and the high school graduate; learning and motivation in early reading; reading strategies for different cultural and linguistic groups; and essential skills and skill hierarchies in reading. (GW)

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Conference on Studies in Reading

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March 1978

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FOREWORD

Problem Focus

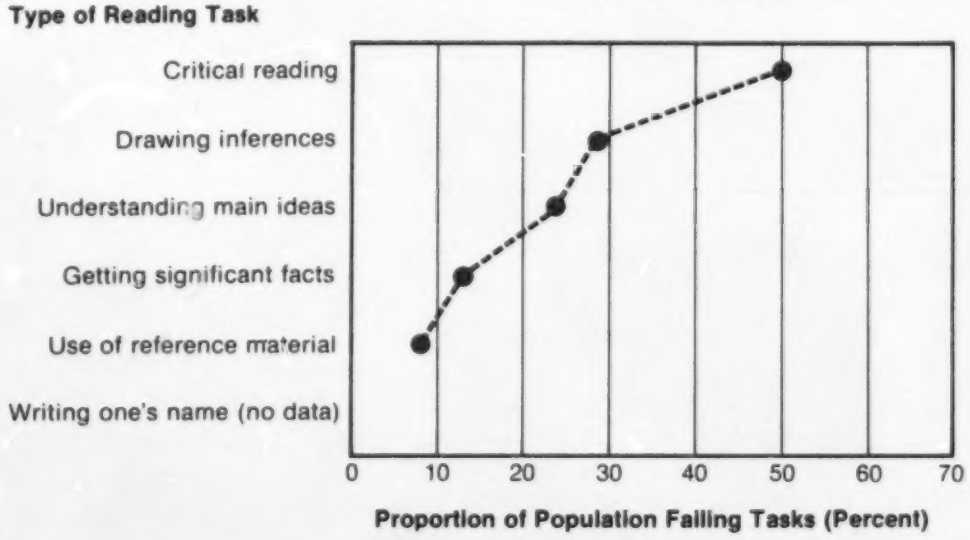
While American education has made great progress in extending equal opportunities for *access* to education for all citizens, there has been considerably less success in providing access to equal *quality* of education. This problem is heightened by more recent aspirations to provide not only equality of access to a quality education, but to ensure equality of *achievement* of a quality education. (See Figure 1.)

As of the end of 1977, more than half of the States had introduced legislation related to the establishment of basic standards of educational proficiency for graduation from high school. Additionally, a bill was introduced in the U.S. House of Representatives to amend the Elementary and Secondary Education Act of 1965 to require States applying for ESEA assistance to provide assurances that they will establish and implement basic standards of educational proficiency, to include the administration of a reading, writing, and mathematics proficiency exam.

The problem facing the schools as they attempt to ensure the achievement of some standard of educational proficiency by each child, is compounded by the fact that the schools are being called upon to provide educational services to an ever increasing diversity of aptitudes, cultural, and linguistic backgrounds. For instance, National Center for Education Statistics data indicate that of the approximately 21 million children participating in

Figure 1

This figure presents data from the National Assessment of Educational Progress (1972) It shows that if our criterion of literacy were that people be able to read reference material, then some 8 percent of the young adults (25 year olds) in the nation would be "illiterate". However, if critical reading is our goal, then some 50 percent of young adults would be called "illiterate". These data show that student achievement in reading, as a problem area, changes considerably depending on our criterion of literacy.



Federal education programs in the 1972-73 regular term, some 350,000 were educable mentally retarded; some 2 million students in 1975 were from households where English was not the usual language; and close to 230,000 children were from migrant households.

The diversity of student backgrounds, coupled with the requirement that equality of achievement be ensured for each child, strains the capacity of the traditional school system, and the traditional job of the teacher. The schools of today, and the teachers jobs of today are greatly different from those of a generation ago. The previous approach to schooling handled the problem of diversity by screening out a significant part of the population, and/or by permitting a wide range of achievement, resulting in many high school graduates with less than 8th grade reading and mathematics abilities. If in fact we are to aim at having each child acquire the literacy competencies of a typical 12th grade student, the goal suggested in "Toward a Literate Society", edited by John Carroll and Jeanne Chall, then the present educational system is just simply not up to the task. In fact, it never has been up to such a task. In this sense, there are no "basics" to go back to—no basic instructional methods, no basic subject matters, no basic teacher training, and no basic management arrangements to permit the accomplishment of a uniform, high quality standard of achievement in the basic skills by all students.

Research on Reading

Shortly after the National Institute of Education (N.I.E.) was created in 1972, the field of reading was selected as one focus of funding research and development activities to help achieve high quality instruction in the basic skills for the wide diversity of students in our present school system. To help identify specific directions for the effort, a variety of meetings were held with groups of teachers, school administrators, and scientists. The most ambitious of the meetings was held in Washington, D.C., in August of 1974. Called the N.I.E. Conference on Studies in Reading, the planning meeting involved over 175 individuals—50 as conference participants and 125 as consultants to the conference.

After extensive consultation with scientists and practitioners in the field of reading, N.I.E. decided to focus attention of the Washington conference on the stage of reading commonly identified as "reading comprehension". They had arrived at the conclusion that major research efforts in the past had often ignored or down-played that critical stage of reading.

Although they realized the impossibility of actually separating out reading comprehension from earlier stages in learning to read—which requires the learner to be able to translate written letters and words into speech—their advice suggested that the comprehension or "reading for meaning" state required far more attention that it had received in the past.

Laying a foundation for the Washington conference were a number of concerns about the state of federal funding of research and development in education:

1. Research in the field of reading has been fragmented and noncumulative.
2. The federal government was not making constructive use of the state of knowledge in the field in their decisions to fund new research and development.
3. There was a lack of positive and firm coordination between the federal government and the professional research and practitioner organizations around the country.
4. A large number of scientists in a variety of disciplines carry out research that could have relevance to reading. N.I.E. feels it important to attract these scientists to work in the applied areas of educational research.

For organizational purposes the Conference on Studies in Reading was divided into ten panels, each prepared to discuss a designated topic related to reading. In reviewing the reports of recommended research and development activities eventually produced by each of the panels, it is clear to see that common themes, concerns and emphases evolved. These are described below in the introduction. It characterizes the larger picture of reading research and sets the stage for placing each of the ten panel reports in perspective. This report was prepared by Sheryl Erickson with the assistance of members of the Basic Skills Group staff.

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INTRODUCTION

Learning to read can be viewed from a number of fruitful perspectives, each depicting a portion of a highly complex set of interactions.

Looking at the Process of Reading

If we try to envision what happens psychologically when a reader comprehends, we will undoubtedly discover intricate and complex processes. As difficult as the task may be, improving our success in teaching reading will depend upon valid descriptions of these multiple skills in operation. In recent years a number of theories and growing amounts of data have developed on what takes place as we learn to comprehend spoken (natural) language. Similarly clear consensus among psychologists about processes of reading comprehension has not been accomplished.

Describing the processes will likely require use of computer technology (e.g., building theoretical models) because of the complexity of interactions and extensive input that reading comprehension inevitably involves. It also will likely start with descriptions of how competent adult readers process printed materials for meaning, supplemented by developmental studies of how children acquire the necessary skills. Two recent, somewhat specialized but integrally related, areas of reading research in this area are studies of the eye-movements of readers and efforts to identify essential skills inherent in the comprehension process.

Looking at the Child

If we look at reading with a focus on the child (or reader) there are multiple and complex factors to consider. First, we might visualize the set of skills the child has to use directly in reading. This might include such varied skills as being able to guide one's eyes back and forth along a line of print, or being able to use intricate strategies for interpreting meanings and remembering them. Whatever the reading skills, we can expect that they are gradually changing and likely interacting with other aspects of the child's development such as language and cognitive capabilities. Research has only begun to show us what the complex of necessary reading skills might be and how they develop. Nor has research given us a picture of how learning to read interacts with other areas of the child's development.

The child will also have a store of knowledge and experience that may or may not relate to reading tasks at hand. He/she will approach reading with some degree of awareness of what various reading tasks require, e.g., remembering facts, following instructions, etc., and likely with some degree of self-consciousness of his/her own thinking and comprehension as they occur. The precise influence of such awareness on learning to read has not been determined.

Another set of factors potentially at work in the child is his/her self image as a student, and whether learning to read is valued in the first place. Family and cultural values have likely formed some answers to questions of why reading will or will not be important. One line of needed research falls into this area, i.e., how do cultural attitudes and values and reader self-concept affect learning to read?

If we view the child in a learning-teaching situation, we would also need to focus on such characteristics as individual learning styles, activity cycles, achievement motivation and ways of relating to people and materials. Each of these types of individual differences could have a significant influence on what a child gains from different types of reading instruction. Further research is needed, first, in measuring such characteristics, and, then, in determining their influence on reading.

Looking at Reading Materials

Another perspective on reading is to look at the printed materials readers are expected to read. A fundamental problem in studying the psychological processes of reading is to be able to determine what informational content a given piece of reading material contains. We do not have standardized tests or ways of measuring the content of reading materials and therefore do not understand how different features of printed materials interact with and influence the reader's abilities.

It is probable that much of the written materials used in school and in various tasks of adult life is not optimally comprehensible to the readers for which the materials were intended. One line of fruitful research is similar to what might be called "readability engineering," i.e., how might the way in which materials are written be changed so that they are more easily comprehended?

Looking at Teaching-Learning Interactions

Children learn to read both from formal experiences (in school) and from informal experiences (from family, community and subculture). If we look at the dynamics of teacher-learner interactions while children are learning to read it can be helpful to use a concept called the "match." A match is a term describing the fit between children's prior experiences in society, their subculture and their families, and the structure of the instructional context in which they find themselves. Presumably the closer the fit—creating a match—the greater the likelihood of the child being motivated and engaged in the task of learning to read, and the more responsive he will likely be to instruction. Research is needed to test the validity of such assumptions and to determine what factors in the creating of a match influence learning to read.

Another fruitful line of research is to look at instructional approaches that have proven themselves successful or at least show promise in teaching reading. Examples are extended use of television as a teaching medium, alternative uses of computers, and training programs that teach readers self-management and self-monitoring skills. We also could benefit from efforts to identify teachers who have demonstrated skill in teaching reading to special groups of students, e.g., students of different cultural and linguistic groups, college students, or beginning readers, and explore possible reasons for their success in teaching.

Looking at Assessment and Evaluation Techniques

In many cases, in order to advance in the most productive reading research, we will first need to improve the research methodology that is currently available. Particular concerns are improved procedures for assessing/diagnosing the reading skills of individuals, and innovative techniques for determining the performance outcomes of entire programs and approaches to reading.

PANEL 1

semantics, concepts, and culture

The ability to pronounce words in a text correctly must be clearly distinguished from the ability to read a text to gain meaning. Correct pronunciation of words depends on what we will call "decoding skills"; reading to gain meaning is what we will call "comprehension." Although the distinction may seem rather simple, being able to observe the distinctions between decoding and comprehending while a reader is reading is not easy. One cannot tell from the fact that a written passage can be read aloud whether readers understand the words they are reading or are simply pronouncing the words.

Reading without comprehension is a waste of time and effort. Yet comprehension is a poorly understood psychological process, and, without a valid description of the skills or process involved, current attempts to teach comprehension skills have not been as successful as we had hoped.

Improvements in reading instruction also rely on our expanded awareness of how other characteristics of the reader and features of reading materials influence learning to read. Panel 1 organized recommendations around four themes: (1) models of comprehension processes, (2) development of comprehension skills, (3) improvement of reading comprehension, and (4) cultural influences on reading comprehension.

Models of Comprehension Process

An understanding of what readers do when they "comprehend" words, sentences and text is critically important to designing instruction that strengthens comprehension skills. Therefore, it is important to generate theories of how the processes of comprehension take place. With such theories we should be able to break comprehension into component skills and begin to derive implications for teaching, materials design and evaluation.

The theories we may create describing reading comprehension will be referred to as "models." Because the term model is used repeatedly throughout the remaining panel reports, it would be helpful to clearly understand what the concept means. Models are descriptions of processes, in this case, processes in the reader's mind as he understands the meaning of words, sentences and texts. A model would likely address questions such as, "What are the specific skills involved in comprehending printed materials; how are these skills combined, and how do they operate?" Because the processes of reading comprehension are so complex and interactive, models will likely be described by use of computers, e.g., by simulations.

Panel 1 recommended attention to the building of models of the comprehension process that would include word recognition, sentence comprehension and text comprehension as they interrelate to each other. Illustrations of recommended research areas were:

- How are words organized in memory and then retrieved for use in reading comprehension?
- How is meaning extracted from sentences in print or speech?
- What mental processes are used by a reader to comprehend sentences out of a text?

Development of Comprehension Skills

That children first learn words by hearing them used is a commonplace observation of child development. The processes by which children conceive of words as "words," identify them in a stream of speech, and begin to assign meanings to them are lesser known. We generally presuppose that children understand when we talk about "words" and the difference between them and "letters" or "sentences." We have very little awareness of how such development occurs.

Learning language structures—one of the most important tasks of beginning readers—clearly requires some degree of ability to think about one's own language. Children older than five are generally able, with varying degrees of proficiency, to segment speech into words and syllables and thus to "decode" the correspondences between speech and print.

Learning the concepts or meaning which language expresses requires a different order of skills. We know little, however, of how children think about their own thinking (called "metaconceptual" skills). This general ability may develop sometime during the elementary school years, and lags in its development could even account for deficient development of adult reading competence. The relationship between basic cognitive development and changes in reading comprehension ability would appear to be a critically important research area.

Knowledge of the course of child development should have important implications both for building models of the comprehension process and for classroom applications. On the one hand, such developmental research can provide insights about how the package of skills underlying adult reading competence is gradually pieced together and finally integrated. On the other hand, the research can help define teaching goals and activities based on reasonable expectations. Panel 1 recommended a series of developmental studies around questions of word recognition, vocabulary acquisition, sentence comprehension and text comprehension.

Improving Reading Comprehension

The readability of instructional materials could be as influential as the skills of the reader in comprehending a text. Various features of the way materials are written can positively or negatively influence comprehension. For example, the proportion of familiar to unfamiliar words in a text can either frustrate or facilitate reader comprehension. Or sentences may be written in a way to focus reader attention, and change the ease of comprehending its meaning, e.g., changing "the bike was ridden by John" to "John rode the bike" or vice versa.

Panel 1 recommended studies of reading materials as well as of training techniques that might enhance comprehension skills. The following are examples:

- How does a reader's knowledge base influence ability to understand a text?
- How can readers be helped to develop self-monitoring skills to see gaps in their own comprehension?
- How can readers be helped to integrate knowledge as they read through a text?
- How can readers be helped to elaborate on relevant information in a text to increase comprehension, e.g., by taking an "active attitude"?
- Under what circumstances do pictures aid text comprehension?

Cultural Influences on Reading Comprehension

Although differences in reading comprehension abilities have been observed among various subcultural groups, how cultural factors affect both reading skills and approaches to reading has not been scientifically explored. Such influences may show up, for example, in: the size and content of children's vocabularies and their use of subtle connotations for particular words; dialect differences in uses of grammar (as in Black English); different strategies (such as playing language games) for approaching particular cognitive tasks.

Panel 1 recommended research that could help determine those subcultural differences which affect reading comprehension most significantly. Areas explored might include: the acquisition of cognitive skills; views of the utility of reading and consequent strategies for approaching particular texts; and interests in different domains of knowledge (e.g., in human relations as opposed to more quantitative subjects).

They also recommended sociological and anthropological studies that could help begin to answer questions of how socio-cultural backgrounds influence reading:

- What setting and experiences promote development of the cognitive skills related to reading?
- How do communicative or expressive resources other than language devices differ among subcultural groups?
- What role does language play in the social life of different subcultural communities, and what language skills are children therefore expected to acquire?
- How does general educational motivation differ in various subcultural groups?

PANEL 2
the structure and use of language

Many types of reading research depend on being able to somehow objectively represent what information is contained in a written text. Information—consisting of ideas and the relationship of ideas to each other—would seem easy enough to identify and describe, were it not for the fact that many of the ideas and relationships of ideas are implicit. Ideas are not always represented literally in print. Take, for example, the following sentences of the type one might find in elementary school readers: "Mr. Howard was a fireman. Firemen must often risk their lives." The fact that Mr. Howard must often risk his life is not *explicitly* stated. Yet clearly this relationship is part of what is *implicitly* contained in the text.

Adding to the difficulty of how to represent the implicit information in a text is the more recently recongnized fact that a potentially powerful influence on the ideas (or structure) of texts is the context in which each idea is enmeshed. For example, the idea of a sentence may depend on the ideas of all previous sentences. Or the ideas in a paragraph may be primarily a function of the beliefs and intentions of the writer when it was being written.

In order to study how readers comprehend materials (i.e., the meanings they take from a text), measures are needed of the "actual" information contained in the text. This measure or representation of actual information is referred to as text structure. With methods of representing the structure of information in a text, we should be able to design more standardized printed materials to use in assessment, to compare different text materials, and to better control some of the many variables in studying how comprehension works.

Panel 2 recommended research that would advance our skills in representing the structures of texts and lead to more controlled studies of how readers extract meaning from texts. The panel also focused attention of recommendations for research into ways of describing the psychological processes involved in comprehension and how such processes develop. Of specialized concern were recommendations for studies of comprehension processes for the bilingual reader who approaches learning to read with two languages as will as two types of knowledge base.

Structure of Texts

Until relatively recently, researchers studying language have limited their view to looking at *sentences* as units and at the grammar (or syntax) of sentences. Many researchers have come to criticize this limited focus on the sentence, believing that the broader context in which a sentence occurs influences its meaning. They argue that speakers regularly produce sentences reflecting the context of the previous sentences produced. This recognition of the context as giving sentences meaning calls for an expanded view by researchers of looking at *texts* as units and grammar as a term applicable to entire texts.

Panel 2 recommended the following types of research:

- What types of computer programs can we design that could generate texts? That could analyze texts?
- What might be grammatic rules that apply to texts as units?
- By what techniques can we compare the structure of information in different pieces of written materials?

Measuring Knowledge Acquired From Text

When we say that readers have comprehended a

text, we do not mean that they have in their memory an exact, word-for-word, copy of the text itself. In comprehending a text, readers transform the specific words and sentences into their own meaningful representations. For example, sentence boundaries are lost as readers construct new ideas in memory. The two sentences—"The house stood on the hill. It was a large house with seven gables."—might be transformed into a representation of "the large seven-gabled house on the hill." Similarly, readers will make inferences not explicitly expressed in the sentence.

The fundamental question of Panel 2 was just what information (word meanings and logical information) do listeners or readers acquire when they listen to or read textual materials? The following are examples of research questions:

- How can semantic (word meaning) information a reader acquires from a text be measured?
- How do individuals and groups differ in the kind and amount of semantic information they acquire from what they read?
- How do children change with age in the information they acquire from texts?
- What are the differences in the processes of acquiring information by listening versus reading?

Text Structure and Acquiring Meanings

Anyone who has tried to put ideas down on paper is probably painfully aware of the fact that most ideas can be expressed in a variety of ways—by a single word, in a phrase, within a sentence, in several sentences, etc. We can present important ideas to readers in a number of different ways and sequences. We may state concepts explicitly, or we may leave them to readers to infer. It is not at all clear why some ways of organizing ideas get their messages across and other ways do not.

Panel 2 recommended research using some of the methodology for representing text structure that is described above. They suggested a series of interrelated studies, e.g., studying the effects of making underlying ideas explicit as opposed to implicit, the effects of choice of words or phrases to express concepts, or the effects of how well connected a text is.

Development of Comprehension Skills

The fact that a reader's knowledge base and the context of written text influence understanding of a text is expecially significant when we view comprehension from a developmental perspective. Childrens' first experiences with language occur in social contexts. A great number of contextual cues are always available: the identity of the speaker, time and place cues, gestures, objects being referred to, etc. Given this rich context, children can use a very limited knowledge of language to understand what a speaker means. They use their understanding of context cues to figure out the meaning of words and sentences they hear.

The kinds of contextual cues children find in texts, however, are very different from those of the social context of oral language. When reading, children must depend more upon the content of the written language and use an understanding of language to understand meanings. One can view language development as movement from depending heavily on external concrete situations to relying on abstract internal knowledge.

Panel 2 identified types of research to study such developmental changes:

- How well can young listeners understand language in situations like formal educational tasks (with fewer concrete contextual cues)?
- What are the differences in the ways language is understood when heard in social contexts versus when read in written documents?
- In what ways can contextual cues be added to written texts to make them more naturally understandable?

Bilingualism

Presently, there is little available research concerned with important and large populations of children acquiring two or more languages simultaneously. The major amount of research on language development has concentrated on children of one language —primarily English.

In addition to studies that would verify language differences among bilingual children, Panel 2 recommended research around factors potentially influencing how bilingual children acquire language, e.g., congnitive development, cultural experiences, different communication styles, etc.

PANEL 3
attention and motivation

Children staring out the window, perhaps daydreaming of a baseball game, will clearly gain little from a teacher's reading lesson. The problem is not a trivial one. Teachers armed with the most up-to-date and effective methods for teaching reading still need to maintain and focus the attention of their students.

What do we know and how can we use what we know about focusing and maintaining the attention of learners in order to maximize learning to read? If we look first at the concept of a child's attention, we can visualize attention as the child's ability to focus on selected pieces of information while ignoring others. Classroom teachers regularly practice ways to focus the attention of children. Moment-by-moment the teacher regulates how much and what type of information the child receives. Some information is highlighted to give it more focus, and continually the teacher tries to suppress distractions in the environment.

In addition to the management of children's attention, teachers regularly work to motivate children, to keep them engaged in a learning task over an extended period of time. Taken together, the management of attention (short term) and management of motivation (enduring) can be called "engagement management." Panel 3 centered its discussions around research that would identify how schools might maximize children's engagement in learning to read.

It would be a mistake to assume that teachers do not now manage attention and motivation, or that they do not manage them effectively. A high percentage of American school children do learn to read. Furthermore, since research on teaching generally lags far behind the intuitive knowledge that teachers use in classrooms every day, it would be presumptuous to assume that the research Panel 3 proposed will yield results to be taken as new prescriptions for teacher behavior. What the research might do is make the processes of creating engagement more explicit and usable for the following ends:

- Children now sloughed off as "dumb" or "less competent" may come to be recognized and handled as special cases needing engagement management.
- Less gifted and motivated teachers might be better able to recognize further ways of practicing engagement management.
- Administrative resources might be encouraged to allow teachers to use new techniques and approaches for engaging children in learning to read.

The panel organized its recommendations into three types of viewpoints: (1) a look at the child, (2) a look at teacher-student interactions, and (3) a look at the teacher.

The Individual Child

The hypothetical student found staring out the window may be doing so for any number of reasons. A baseball game may in fact be going on outside which is distracting; the child may be worried about understanding the lesson, or may see the lesson as irrelevant. The child may also be influenced by a natural biological cycle in which he is more attentive at some times and less attentive at others during the day.

Numerous other possible explanations could be created. If a teacher is to help this child, it is important to understand exactly what the problem is.

Panel 3 recommended research that will help us understand possible explanations for such attention and motivation problems. The following questions illustrated the types of suggested research:

- What are some of the physiological processes that occur in a child related to specific reading

related behaviors, e.g., what happens physiologically when the child is most attentive?

- What cycles of activity level can we describe in individual children or different types of children during any one day?
- What environmental factors, e.g., distracting tasks or multiple tasks, influence reading performance?
- How do children's understanding of their own cognitive skills relate to their engagement behaviors in the classroom?

Teacher-Student Interactions

Common sense tells us that the styles, rhythm and purposefulness of students in classrooms can be influenced in positive ways by how the teacher presents materials and interacts with students. We assume that children differ in the types of teaching environments in which they learn best. We also expect that individual children will use a teaching-learning environment differently throughout a given day and differently from day to day.

The problem for research becomes one of identifying what the teacher should look for and use in setting up optimal learning situations in response to individual children throughout a day. For example, how can teachers estimate the level of engagement of an individual child in order to respond immediately to this engagement one observed? As teachers orchestrate the flow of activities and information within classrooms throughout a day, it would be helpful to be clearly aware of successful ways to promote engagement in different settings and circumstances.

Panel 3 suggested research around the following types of questions:

- How do teachers presently structure classroom time allotted for reading instruction, e.g., how much time is spent in actual instruction and how much time in trying to motivate children and focus attention?
- How do different types of classroom settings for teacher-student interaction influence student engagement in learning tasks, e.g., tasks of reading?
- How do specific teacher behaviors in gaining and maintaining attention actually relate to children's engaging in learning tasks?
- How does the engagement of a student change with different types of skills being emphasized in a reading lesson, e.g., decoding skills versus comprehension skills being emphasized?
- In what ways do teachers time and pace their attempts to manage engagement of their students?

The Teacher

Teachers, like children, must be regarded as developing and changing. We generally describe teachers in fixed terms—as people with definite styles, traits, abilities, knowledge, etc. Just as children can be expected to have cycles of attentiveness and performance that fluctuates during a given day, so can the teacher's behavior be assumed to vary daily. Also, as we expect children to change and develop over time, teachers' understanding of their roles and their teaching skills can be assumed to change over time. Any research on teacher behavior related to engagement should be based on these assumptions of adult change and development.

Panel 3 recommended studies of teachers and teacher roles as they influence learning to read:

- In what ways do teacher attitudes toward teaching and the purpose of reading evolve as they gain additional knowledge?
- How are teacher attitudes related to observable types of teaching behaviors in classrooms?
- What are the relationships between teacher attitudes and student engagement?
- What are the relationships between teacher performance cycles and student engagement in the classroom?
- How might we observe classrooms to gain some measured index of how engaged the students are in learning?

PANEL 4

modeling the reading process

Because the psychological processes involved in reading comprehension are complex and interactive, a research approach called "modeling" seems most appropriate for capturing the phenomena. Modeling is an umbrella term for a research approach that entails describing complex phenomena by computer simulations, and building theoretical models. The modeling of reading comprehension is sometimes referrred to as an "information processing" approacl.

Building models that describe the psychological operations of reading can lead to numerous practical applications. For example, models could potentially allow us to more precisely diagnose reading difficulties. Being able to describe the process of comprehension could enable us to isolate the causes of reading failures, to more specifically pinpoint where skills in the reading process have broken down. We now identify reading failures with vague concepts like the inability to blend, to recognize words or to get the main idea. What is needed (that models could provide) is precise detail on the psychological processes behind such behaviors. Two other potential values in describing the reading process would be the ability to more skillfully evaluate current teaching and testing practices and the ability to improve our methods of diagnosis and intervention to improve reading comprehension.

Panel 4 organized its planning and recommendations around the four research areas described below:

Modeling Adult Competence

Studies of word recognition comprise the major portion of experimental research literature related to reading. There is therefore no dearth of relevant research at this level of reading comprehension. What does exist however has not been based on or placed in the context of a larger model of reading comprehension, e.g., comprehension as information processing.

When looking at reading comprehension through an information processing model, reading can be seen as involving a sequence of recognizing meanings from printed text. As a person reads, he recognizes successively larger and more abstract meanings, e.g., he integrates the meanings of a string of words in order to understand phrases, and integrates phrases to understand sentences. Presumably, the meanings in successive sentences build into a broader understanding of a paragraph or story as a whole.

Research procedures have not been well developed for studying this process of integrating meaning. As a consequence we have accumulated little knowledge about the processes upon which to build further research. To begin to meet such a need Panel 4 recommended implementing a number of studies of word recognition and higher order comprehension processes around the following types of questions:

- What visual information in a string of letters does a reader use to recognize a word? How does spelling or visual form of a word affect recognition of the word?
- Does a word's place in the sentence structure and/or meaning of words around it affect its being recognized?
- Does saying a word subvocally influence recognition of the word?
- What processing of sentence grammar and/or word meanings is necessary for a reader to integrate meanings when comprehending sentences?
- In what sequence or order are the meanings in sentences, paragraphs, and texts recognized?

Development of Reading Ability in Children

Increasing our understanding of the development of certain reading skills in children could have

potentially important implications for instruction. Yet few attempts have been made to construct models to account for development. In some cases the construction of models has not been feasible given the lack of current knowledge in areas of cognitive, memory and language processing skills in the important 8-12 year old range. In other cases, the construction of models has had to await an adequate understanding of adult skills in reading comprehension.

Given these reservations, Panel 4 concentrated its recommendations on studies that would look at reading processes of "skilled" readers, and on studies that would generate useful information for later developmental research. The following questions illustrate areas of recommended research:

- Which methods used in studying adult comprehension processes are valid for studying children?
- Which of the processes identified in skilled adult readers are operative in children?
- What role does a child's instructional history in reading play in the development of the child's reading comprehension skills?
- What are the differences in the reading processes used by children who are poor readers versus those who are competent readers?

Eye-Movement During Reading

To say that readers move their eyes in order to read seems to be stating the obvious. No one would argue that we do not move our eyes across a page—sometimes looking back to what we have already read, sometimes skipping forward—in order to derive whatever meaning we can. *How* we move our eyes, however, is not so obvious.

Readers may move their eyes deliberately, on the basis of what they have read and what they can see in the periphery; or the eyes' movement may be constrained physiologically in such a way that they move across the page at a fixed rate. Current models of eye-movement guidance fall on both sides of this question; empirical data are insufficient to support conclusively either type of model.

Models of eye-movement guidance based on the view that movement is voluntary describe reading as analogous to picture scanning. These models assume that readers move their eyes on the basis of what they have already seen and what looks interesting in peripheral vision, as in the viewing of pictures. Panel 4 recommended a number of studies that would help to test some of the assumptions of this viewpoint. The following questions illustrate some of the recommended concerns:

- How accurately can readers move their eyes when scanning print?
- In what ways does a reader use the information seen at a fixation point and information seen in peripheral vision when scanning a line of print?
- What characteristics of the print and page does a reader use in guiding regressive eye-movements?

Information Processing During Careful Reading

The skills competent readers bring to a reading task seem to vary according to the demands of the task itself. For light information loads, or for tasks in which readers are not concerned with complete or nearly complete understanding of ideas or facts, reading may be composed of predominantly forward-going eye-movements. However, for tasks involving a great deal of information to be processed and requiring recall of complex information, competent readers' eye-movements change. This type of reading, for lack of an agreed-upon label, is called "careful reading." As integration of information and demands for recall of information increase during careful reading, competent readers begin to move their eyes backward and forward taking in new materials and returning to previously scanned information as they discover what it is they need to reexamine. In some cases subvocalization may be involved.

This type of reading probably predominates for almost all subject matter reading children encounter in school. Indeed, it seems to be the most effective method for extracting meaning from complex reading materials. The combination of skills used in careful reading, however, is not taught in school. Instead, reading has been approached as a forward-moving process with only occasional regressions.

Panel 4 recommended a number of studies that would help to identify the specific skills and their interrelationships in the process of careful reading. It seems that the particular set of skills in careful reading would be useful in reading instruction for improving comprehension. Research is first needed to develop techniques for measuring the process of careful reading, and then to use the techniques evolved to observe the skills in careful reading:

- What measurement procedures can be developed to track the kind of eye-movements typical of careful reading, e.g., vertical or diagonal scanning?
- What measurement procedures can be developed to observe reading behavior under varying information loads and different demands for recall?
- How accurately can a reader return to focus on previously read information on a page? How does nonverbal information (such as page configuration and italics) affect accuracy?

PANEL 5

assessment of reading comprehension

The term "reading comprehension" has come to mean many things. Any systematic approach to the assessment of reading comprehension must very explicitly define the types of performances considered to represent reading comprehension. These explicit descriptions in essence become working definitions of reading comprehension for the theorist, experimenter, designer, teacher, evaluator, etc.

Panel 5 favored looking at the many practical uses of written material as sources of those performances important to identify with comprehension. They also viewed reading comprehension as involving many different performances depending upon the type of written material being read.

Research recommendations by Panel 5 cover a broad spectrum of interests from research determining the functional uses of reading in American society to creating guidelines and aids for writers and editors in translating what is learned from research into more tailor-made comprehensible reading materials.

Functional Reading Skills

What must individuals know to use effectively the written material they will encounter in life? In order to find out, it is necessary to determine in considerable detail the various uses of written materials and the practical and personal demands society and cultures make on various individuals in the use of these materials.

Although the ability to find employment is a major concern to individuals, other areas of life make demands on literacy skills: managing a family (shopping, caring for the children, consumer purchasing, etc.); attending school; participating in community affairs, etc. We have little knowledge of the types of reading tasks involved in such activities and hence, little understanding of how to teach and evaluate the skills needed to perform these various tasks.

Based on the view that research and instruction in reading should reflect as accurately as possible the nature of reading as it actually occurs in American life, Panel 5 recommended the following research areas:

- What are the most important functional reading tasks (for school, personal and occupational situations) required by living in American society?
- In what order of difficulty can these reading tasks be organized?
- Limiting our attention to the functionally more important uses of written materials, what are the detailed processes involved in reading such materials?

Psychological Factors Involved in Reading Comprehension

Reading comprehension entails many different performances involving many different kinds of written materials. It is also likely that there are a small number of basic psychological processes which occur across this variety of reading tasks. Constructing assessment instruments, as well as improving reading instructions, depends upon making explicit how these basic processes work. Models of the processes involved in reading comprehension are needed.

Panel 5 recommended that research be implemented related to factors that influence reading comprehension, and that the results of this research should be included in building models of psychological processes:

- *The reader's knowledge base:* Comprehension of written materials is influenced by the knowledge a reader brings to a reading task. For example, a reader has to connect what he is reading (the string of words on a page) with information he

already knows (his knowledge base) to draw inferences about what the text means. It is probably true that many comprehension failures are not failures to understand the words per se, but failures to give the words the author's intended interpretation. The influence of a reader's knowledge base on comprehension needs further study.

- *The text structure:* The form and content of printed material (its text structure) influences a reader's ability to comprehend its meaning. Presently we have few, if any, agreed-upon methods for representing text structures to enable research to be done on the processes involved. Standardized textual materials are needed. Such materials might take the form of texts with sentences and paragraphs scaled along various dimensions such as abstractness, reading times, and ease of recall.
- *The reader's conception of the task:* Another significant influence on a reader's comprehension of a text is the reader's concept of "why" he is reading the particular piece of material in the first place. Research is needed to determine how the reader's concept of a task influences both his level of comprehension and his memory of the information in the text.

Assessment of Reading Skills

Current assessment instruments for measuring reading skills suffer from a number of weaknesses. First of all, the instruments are not based on an adequate analysis of the literacy demands of society. Unfortunately, much evidence exists that tests are being constructed and used that do not adequately represent the world outside of the school. A second weakness of reading comprehension tests is that they are not based on validated conceptions of the processes entailed in reading. Items for such tests have not been selected or constructed in an orderly, rule-governed fashion. Consequently the intuitions and judgments of test constructors carry a heavy influence.

With an understanding of these weaknesses reading comprehension tests could be made more functional. The established practice of giving a reading test and representing the individual's reading competencies by a grade-equivalent score is minimally useful. It merely indicates how the individual compares to others. The score does not tell the evaluator, teacher, or individual anything about what the individual knows or specifically where his reading difficulties may lie.

A useful alternative to grade-equivalent (called "norm-referenced") tests might be a form of testing called "domain-referenced" testing. Items on these tests would represent specific types (or domains) of knowledge or particular types (or domains) of reading materials. Testing by this approach would show directly the kind of material and difficulty of material an individual is capable of reading with comprehension.

Refining of domain-referenced tests to the level of very specific skills would also enable the test to pinpoint precise difficulties an individual may be having with comprehension skills.

Panel 5 made a series of recommendations for research projects around the following assessment issues:

- What systematic procedures can we develop such that evaluators can construct equivalent assessment instruments based on validated theory of the reading process?
- What testing procedures can we design that would tell us directly the kind and difficulty of material a reader is capable of comprehending?
- How can we test readers to yield specific information about individual reading problems?

Design and Evaluation of Written Materials

It is probable that much of the written material used in school and various tasks of adult life is not optimally comprehensible to the readers for which the materials were intended. Research on language and learning indicates that a reader's knowledge and experience related to a reading task is probably the most important factor in determining whether or not the reader will successfully comprehend a piece of written material. Because writers and readers are often drawn from different milieus in society, the writer's assumption about certain characteristics can easily be wrong. Further research is needed to determine what characteristics of a reader population would be of value to writers or editors in creating written materials tailored to (and therefore more comprehensible to) different populations of readers.

As we advance in our understanding of the psychological processes involved in comprehension and in our skill in analyzing written materials, the production and use of written materials is very likely to change. We cannot, however, afford to leave the process to

chance. Preparing written material is a difficult practical activity. The emergence of new scientific information about the use of written material may make the writer's, producer's or editor's task at first more difficult rather than easier. It seems barely sufficient to supply writers and editors with basic psychological information on how humans comprehend. We need very imaginative work to help the writer or editor make use of psychological information. We need to design practical systems and aids for producing written material.

Panel 5 recommended research in the following areas related to designing and evaluating materials:

- What information about a reader population would be of value to writers or editors in creating more comprehensive materials?
- What techniques can we use to be able to characterize how difficult a given piece of material might be and what the demands of the material are on the reader?
- What aids and guidance can we give to writers and editors of reading materials to help in translating research results and theory into practice?

PANEL 6

application of existing reading comprehension research

Research related to reading comprehension of necessity involves recognition of the differences in views between "basic" and "applied" types of research. It also demands recognition of the difficulties of applying the results of theory and research to educational practice. For example, it is typically the scientists' stance to withhold policy judgments and to claim that we need more knowledge before we can make any proposals for action. On the other hand, practitioners concerned with meeting immediate, pressing social problems are often impatient with delay and demand quick and practical programs for widespread use.

In seeking to recommend research that would bridge the gap between theory/research and application in practice, Panel 6 identifies three means by which theory, research and practice can be closely linked by:

- Deriving implications from current theory.
- Formulating principles from successful instructional practices.
- Analyzing functional reading tasks.

Deriving Implications From Current Theory

Research on instruction in reading comprehension can and should draw from current theories of language comprehension. In recent years we have seen the development of a number of theories and growing amounts of data on how natural language comprehension takes place. At this stage of research however, no clear consensus exists among psychologists about comprehension processes. Several theories are now being investigated, and several can already be mined for implications to instruction.

In any attempt to apply psychological theory to the practice of reading instruction, three steps would appear essential: (1) a clear description of the theory, (2) demonstration of evidence for the scientific soundness of the theory, and (3) deriving implications of the theory for teaching of reading comprehension. Panel 6 chose one broadly stated theory of comprehension and used it to illustrate the three steps necessary in deriving educational implications for reading instruction from psychological theory.

Formulating Principles From Successful Instructional Practices

There are many instructional practices being used within our schools which can be considerd successful. Many educators are working in ways that seem to be effective without necessarily being able to say why their methods work or to describe a corresponding theory.

Clearly, we could gain valuable information if the ingredients for their success could be isolated and defined. Through careful examination, principles could be derived from which we could design new teaching techniques and reorganize existing ones.

Panel 6 identified a number of instructional practices which appear to have had considerable success and promise in teaching reading comprehension. Their recommendations revolved around support for research in (1) using computers and other technological "hardware," (2) teaching by contingency management, (3) using techniques to broaden readers' knowledge base, and (4) training readers to monitor their own comprehension processes.

Analyzing Functional Reading Tasks

Ideally, reading instruction should prepare students to carry out, without difficulty, those reading tasks they can be expected to encounter as adults. It seems logical then that reading research should pay some

attention to identifying these "real life" reading tasks and to defining "comprehension" in terms of a reader successfully completing such tasks.

By starting research in reading instruction based on the requirements of real life comprehension tasks, there is a potentially closer link between research and practice. It avoids the possibility of tying research to tasks that are convenient on tests or in the laboratory, but not necessarily of practical value. Also, if psychological constructs are used in identifying reading processes, it brings psychological research and theory directly to bear on very real practical problems.

Panel 6 recommended the use of a task analysis research approach to help identify processes involved in reading comprehension. Four types of concentration were suggested:

- To generate a list of comprehension tasks that individuals frequently encounter in school and outside.
- To analyze these tasks and describe the psychological processes they represent.
- To use the analyses to design methods for teaching tasks directly and teaching subskills common to several tasks.
- To create diagnostic tests of comprehension skills based on the types of skills identified in the analysis of tasks.

PANEL 7

reading comprehension and the high school graduate

In the past decade many thousands of young adults from diverse cultural, racial, and ethnic backgrounds have entered our institutions of higher education. In many respects their educational needs have differed from those of students who have traditionally participated in higher education. For example, many of these new students have not developed the basic reading, writing, and study skills for successful participation in college level programs. Just as the "new students" are not prepared for colleges as they presently exist, so our colleges,with all their physical, intellectual and human resources, are not prepared for the "new students." Panel 7 concentrated its attention on research recommendations to expand our awareness of student skills and needs and our understanding of possible institutional changes.

Intervention Programs

The problem of inadequate communication skills among entering college students is not new. State universities, and non-traditional, private institutions for some time have been dealing with a considerable percentage of students unprepared for the reading and writing expectations of successful college work. As a consequence, a variety of intervention programs have been undertaken and increasingly studied.

Even with an increase in studies of college level programs, studies of "program effectiveness" have been very limited and often suffer from poor research methodology. Recognizing these problems, Panel 7 recommended research in the following areas:

- What types of intervention programs have been used for adults with reading and writing problems (both within and outside of traditional academic settings)?
- What methods, materials and contexts were used?
- In what ways were these programs effective?
- In what ways did they fail?

Studies of the New Population of Students

Knowledge about the new population of college students is fragmentary. While some research has been undertaken on new students and on the institutional programs serving them in colleges, this research has generally been limited to estimates of reading difficulties and to studies of attrition rates. Very little is known about the characteristics, experiences and motivations new students bring to the academic setting and the attitudinal variables affecting their reading and writing abilities.

Unlike traditional college students, many of these new students are often the first of their family or friends to attend college. They usually therefore lack "models" for what it is to be a student in a college learning situation. For example, they may not have developed an awareness of themselves in the student role such as self-management skills in studying, self-evaluation skills in knowing how well they are doing, or time-management skills related to reading different types of materials.

The likelihood also exists that entering college creates a powerful dilemma of self-concept and complex demands on this population of students. For some, the concept of "studenthood" may mean placing themselves in a position of possible failure. It may mean allowing themselves to identify with an image of themselves as being "college educated" that deviates sharply from that to which they are accustomed in their families or culture. For many students, the process of integrating the emerging self-image and new skills with past ties may be a major obstacle to a smooth transition to studenthood that living in a college environment demands.

In order to begin to accumulate some of this type of descriptive information for use by post-secondary institutions in improving instructional programs,

Panel 7 recommended research around the following questions:

- What are the characteristics, experiences and motivations the new population of college students brings to the academic setting?
- What are the tasks and demands involved in being a college student, e.g., what skills and awareness do we assume students have when they enter college?
- What effect do attitudes of college instructors, of college peers, and of the new college students themselves have on their developing of reading and writing skills?

Testing and Diagnosis

Educators lack information to assist in the diagnosis of reading and writing strengths and weaknesses of new college students. Tests currently available for diagnosing reading and writing-related skills are often written and normed for children and therefore fail to measure conceptual and specialized vocabularies developed by young adulthood. Current tests also fail to provide a detailed diagnosis of the kind of difficulties students encounter in reading. For example, tabulating the number and type of reading errors on tests currently used does not identify factors producing the errors of specific skills that need to be developed.

Educators also lack accurate ways of measuring the reading and writing demands imposed in higher education content areas. Different reading skills may be needed for reading in different content areas, e.g., reading a political science versus a biology textbook.

To develop more effective ways of measuring reading and writing skills and demands of various higher education content areas, Panel 7 recommended research around the following questions:

- What reading, spelling and writing tests are currently in use in colleges and universities for this new population of students and what types of assessment tools might need be developed?
- How can we measure the task demands of various types of reading materials for college students?
- What criterion can we use to determine and improve the readability of college textbooks, e.g., sensitivity to skills and learning styles of the new population of students?

Exploring New Instructional Strategies

Experience thus far with college level programs suggests the fruitfulness of some instructional approaches and the inadequacy of others. What we need is a clearer sense of the directions successful experiences point and an understanding of ways to encourage institutional commitment to new approaches.

Although we can suggest several promising innovations worth investigating, many of the changes that seem worthwhile are going to be major ones and may encounter institutional resistance. For example, some responses to the needs of the new population of students will likely require major changes in the institution such as restructuring and resequencing of courses, adding new content courses, providing supplementary supportive services, and training instructors.

Traditionally college instructors have not received any teacher training per se; their training has focused on the development of expertise in a discipline. Given the needs of new students, this training is inadequate. It might help to expose instructors to the broader phenomena of language: the nature of dialects, the history of English and how it continually changes in vocabulary, syntax and pronunciation, and current thinking on reading, writing and comprehension skills.

Panel 7 recommended research around several promising instructional strategies as well as around efforts in training college instructors and changing institutions:

- What are the relative merits of teaching reading and writing skills as independent skill courses versus in conjunction with academic discipline courses?
- How can students' whole communication abilities (speaking, writing, reading, listening, etc.) be developed simultaneously, e.g., using strengths in some areas to improve weaker areas?
- In what ways might television be used as a medium for teaching both reading skills in general and reading skills in the context of academic disciplines?
- How might we most effectively train college instructors for the attitudes and skills needed in teaching the new population of students?
- In what ways have, and can, institutions successfully reorganize themselves to accommodate the new students?

PANEL 8

learning and motivation in early reading

For substantial numbers of children entering schools, learning to read is neither an easy nor a rewarding experience. The problem area of Panel 8 was to identify, develop and compare means by which children's motivation to learn to read might be strengthened and maintained.

This is not a new problem. Investigations of children learning to read and the designing of strategies for reading instruction have been among the most active areas of educational research and development. In the panel's view, however, significant dimensions of the problem have been generally overlooked or inadequately investigated. They chose for their focus of research recommendations in the four areas below.

Individual Differences in Achievement Motivation

Recent research indicates that the particular incentives underlying achievement motivation may differ depending on the nature of socialization experiences a child has had. For example, it now appears evident that for a number of sociocultural groups (those representative of certain groups of Black Americans, Mexican Americans, Puerto Rican Americans, Japanese Americans, Chinese Americans and others) the goal of socialization is to develop in the child a strong sense of loyalty and responsibility to the family. For a child to strive for individual gain would be considered to be selfish. Indeed, competitive behavior which stresses personal advantage would be seen as being destructive to the family.

Additional research suggests that children of various subcultural groups view learning to read differently. For example, some may see reading as a means to some other end; others may see it as an end in itself. Some may offer individualistic reasons (so I can get a job); others may be collectivistic (so I can read to my family). If the sociocultural systems of a child's home and school differ very markedly, teachers could easily misinterpret some subcultural children's behaviors to mean they lack motivation to achieve, when the more basic problem may be a "mismatch" between teaching strategies and individual differences based on cultural backgrounds.

Therefore, to be able to design more effective strategies for teaching reading to all children, we need to understand more fully the different reinforcement and motivational requirements different populations of children bring to school. For these reasons, Panel 8 recommended research around the following questions:

- What are the differences in reinforcement and motivational styles unique to various subcultural groups?
- How have the socialization practices of subcultural groups influenced such differences?
- How do children of various cultural backgrounds view learning or not learning to read?
- How can teachers determine what materials are interesting and meaningful to use in motivating each child to learn to read?

Interactions in Reading Instruction

It is probably time we abandon the tendency to think of the "good learner" as a passive receiver of the teacher's knowledge and of the "good teacher" as a skillful giver of information to the learner. An alternative is to view the teacher-learner dyad as involving two-way interaction. Although its special property is that some set of skills initially possessed by one partner is to be transmitted to the other *both* partners are developing, not just the learner, and information is communicated *both* ways.

Teachers and learners interact on the basis of the

earlier experiences each has had with other adults and children, particularly from other teacher-learner dyads of which they have been members. If children have learned from their mothers, for example, then the communication skills built up in that dyad transfer to a greater or lesser extent, depending upon the extent to which the teacher behaves as the mother (or father, sibling, or other teachers) behaved in interactions with the child. It will also depend upon the extent to which the child behaves as previous pupils have behaved in the teacher's past experiences.

Better understanding of this interaction process could lead to the design of new and improved methods of reading instruction, as well as the design of richer preschool experiences that would enhance early learning in preparation for reading instruction. On that basis, Panel 8 recommended research around the following questions:

- What patterns of interactions or communication styles develop between children and their early teachers, e.g., their mothers?
- How do these interaction patterns transfer to teacher-learner dyads in school, e.g., in reading instruction?
- How do interactions of teachers with learners change over time and transfer from one child to another?
- What are facilitative versus nonfacilitative behaviors when learners interact with tutors?

Language Development and Learning to Read

A conclusion widely held through the 1960s was that children have mastered almost all of the grammatical structures of their language by the time they start school at ages 4 or 5. Recent research indicates that, on the contrary, language skills, e.g., speaking, listening, etc., continue to be developed and refined over the early school years due to maturation, new experiences, and possibly due to reading instruction itself.

A better understanding of these developments and interactions should help in designing more effective instructional methods and texts for early reading. Panel 8 focused its recommendations in four areas seen as having direct relevance to reading instruction:

- How does the development of syntactic knowledge in school-age children influence acquisition of reading skills?
- What are the relationships between listening skills and reading skills in the early years?
- What are the effects of teaching reading by using writing as an integral part of the curriculum?
- How might television be used more effectively to teach reading not only to children but to adults as well (such as to adult illiterates)?

Assessment of Reading Skills and Evaluation of Program Outcomes

Although methods have been developed in educational research for describing the physical, social and interactive environments in which teaching and learning occur, what does *not* exist is a system for describing the ecology of teaching-learning reading. The selection and/or development of such measurement instruments must reflect the full complexity of the teaching-learning reading process. This development would likely include, for example, description of the many factors in teacher-learner interactions, variables of particular curriculum approaches, multiple motivational factors, and varied student performances.

Likewise, the state of the art in assessing reading skills in individual children leaves much to be desired. On the one hand, a host of standardized survey reading tests are meant to be appropriate to the entire spectrum of reading curricula. These, however, fail to adequately assess any single curriculum. On the other hand, a large number of tests of discrete reading skills exist—tests that may be appropriate to a single curriculum but that cannot be used to evaluate multiple approaches.

With increased interest in school accountability, accurate measures of the effects of curriculum programs and effective techniques for diagnosing and correcting individual student problems become increasingly important. We need to develop evaluation methods that can be easily used by program planners, school administrators, and teachers. Panel 8 recommended research to address such measurement and evaluation needs:

- How can we systematically describe the complex processes that occur during teaching-learning to read in classrooms?
- How can we improve current methods of measuring children's acquisition of reading skills?
- How can we compare reading curricula to determine which variations optimize reading outcomes?
- How does the quality of time devoted to reading instruction influence acquisition of reading skills?

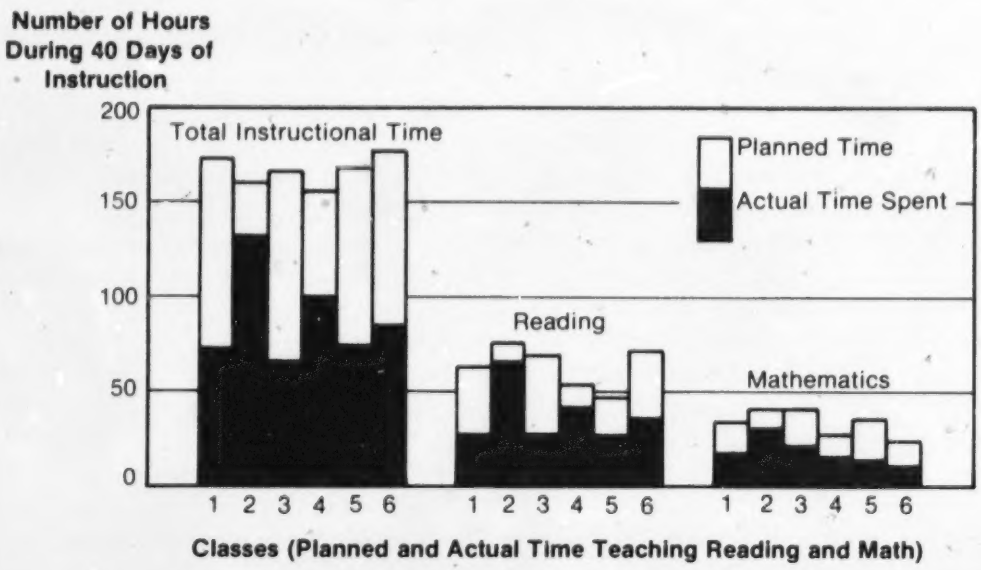
Figure 2

The Beginning Teacher Evaluation Study being conducted by the California Commission for Teacher Preparation and Licensing is showing that:

- Effective teachers of the basic skills are those who maximize the amount of time that students spend in active learning.
- The students of teachers who spend the most engaged time on task exhibit the greatest achievement gains in reading and mathematics.

NOTE:

- There is a gap between the time that teachers *plan* to spend, and the actual time they spend at instruction.
- Teachers vary in terms of both the amount of time they plan to spend on the basic skills, and the amount they actually spend.



PANEL 9

reading strategies for different cultural and linguistic groups

Until recently, minimal emphasis has been placed on research into the possible influences of children's social, cultural and linguistic backgrounds on their learning to read. Researchers presumably assumed either that there were few differences in the background experiences of children or that such differences had little effect on the process of learning to read. It has become clear, however, that the high rate of failure among children of different cultural and linguistic groups to learn to read may be in part a result of a continuing failure of educators in the mainstream culture to understand the situation in which such children find themselves upon entering school.

A "mismatch" frequently occurs between teaching practices and learning characteristics of the children from different cultural and linguistic groups. The environments teachers set up, the teaching approaches they use, and even the type of materials and assessment instruments they employ may not fit the methods of learning, of communicating, and of relating to others of the different cultural and linguistic groups that may be represented in the classroom. Assumptions are often made that all of the children in a classroom will and should learn in the same style, with the same motivations and incentives.

Schools have until recently known little about possible ways to counteract the mismatch. As a consequence, they have usually attempted to force students to conform to the sociocultural systems of the schools, which has resulted in value conflicts, anxiety and frequent failure for those students of culturally and linguistically different groups.

The research projects recommended by Panel 9 are intended to generate information that could help schools be more responsive to such individual and cultural differences among children.

Characteristics of Children

Traditionally, schools have been oriented toward children with whom school personnel were more familiar. These in general have been children from the mainstream American middle class culture, the most common cultural background of teaching personnel. Research is needed to determine—with accuracy and precise detail—how children from linguistic and cultural groups differ from children of the mainstream culture. Such information can be used as a basis for organizing instructional programs. It can help in training teachers, in designing teaching materials, and in developing assessment techniques that more likely match the students with whom they will be used.

Research recommendations of Panel 9 are illustrated by the questions below:

- What are the relationships between social variables and skills in learning to read, e.g., between the family roles played by a child's parents and the child's cognitive style (ways of thinking and seeing the world)?
- What are the sets of values different cultures hold about learning to read?
- How does a child's home language influence learning to read, e.g., what are the advantages or disadvantages for children, whose home language is not English, of being taught to read in their own language or in English first?

Teaching

Children from different cultural and linguistic groups may experience failure in school partially because teachers are unfamiliar with children's learning styles. The teacher may fail to capitalize on the assets of the child because of unfamiliarity with what motivational approaches work with the child, how the

child commonly and most successfully communicates, and how the child has learned to relate to adults and peers. The teacher may also fail to capitalize on the assets of the child because of unfamiliarity with the values the child has learned from his family and culture about reading. In addition, teachers of cultural and linguistic backgrounds that differ from their students' may experience difficulty in communicating effectively and establishing interpersonal relationships with their students' parents, resulting in discontinuity between the child's experiences at home and at school.

Panel 9 outlined a series of research areas that would potentially provide information for teacher training and improved instruction:

- What are the effects on reading of matching teachers and children with the same type of learning styles?
- What are effective ways of preparing a teacher to teach children of different cultural and linguistic groups?
- In what ways can we change teachers' attitudes toward different cultural and linguistic groups, e.g., eliminate stereotyping?
- What are the characteristics of those teachers observed to be successful in teaching different cultural and linguistic groups of children?

Learning Environments

It seems probable that the organization of the learning environment will interact with the characteristics of children from different cultural and linguistic groups and influence how they learn. For example, it has only been in the last five years that research has made it possible to tailor the learning environment of a school and classroom to unique learning (cognitive) styles of individual children. We have begun to see how open classrooms versus more closed-structured classrooms work differently for different types of children.

It also seems probable that the human environment of peers and adults influences a child's learning, e.g., through its effects on aspects of self-concept such as ethnic pride. Panel 9 recommended a number of studies around questions of the learning environment

- How does the structure of the classroom, e.g. open or closed, interact with different learning styles to affect learning?
- What are the effects on reading ability of grouping children homogeneously or heterogeneously according to culture and language?

Role of Home and Community

Looking at the characteristics of children, the teaching process and the learning environment focus attention on the *formal* learning process directly connected with the schools. An *informal* learning process also takes place in and around a child's home and family.

Research findings have clearly established that differences in achievement are less the result of characteristics of the schools, classrooms or even teachers, than they are the outcome of family background. Particularly important are the characteristics that define the family in relation to its social context, e.g., in relation to the world of work, neighborhood and community. It is now time to go beyond the artificial formal environment of the school setting to determine the characteristics of the larger informal learning environment in which children spend a good deal of their time, such as the community and the home.

Although the home and community have been traditionally seen as socializing agents and therefore parts of the teaching-learning process, just how they contribute informally to the learning of specific skills such as reading is not well understood. This lack of knowledge becomes a crucial factor in efforts to educate groups of children of different cultural and linguistic groups. Panel 9 therefore recommended the following types of studies:

- How might we measure a community's perception of school and especially its view of learning to read?
- How might we measure parents' views of their involvement in teaching reading?
- What are the effects on children's reading achievement of having persons from the community (other than parents) become informal teachers and supporters of reading?

Instructional Materials

Research suggests that the type of cultural content in reading materials may influence a student's motivation to read. Such a viewpoint, however, needs careful investigation. We need to examine precisely how existing reading materials affect *each* linguistic and cultural group as its members are learning to read.

The content of materials also is likely to affect students' self-concepts as well as concepts of their

cultural group. For example, if the culture of the student is excluded from the materials, or portrayed negatively, or if the culturally relevant material is of poor technical or literary quality, the material may not only be ineffective in teaching reading but also be destructive to childrens' views and valuing of themselves.

In the process of studying the effects of the cultural content of materials on learning to read, research efforts are needed to review and revise existing materials that inaccurately portray different cultural groups. Out of such research could evolve helpful practical guidelines and techniques to help school administrators, curriculum specialists, teachers, etc., in evaluating and selecting materials.

Approaches to Assessment

Methods of carrying out research with different cultural and linguistic groups are almost as important as the research itself. Too often in the past, different cultural and linguistic groups have been subjected to investigations by researchers unresponsive to the cultural values of the group and too unfamiliar with the environment to obtain meaningful results.

Research has shown that traditional forms of testing and assessment, i.e., achievement, I.Q. and reading tests, have been detrimental to children from different cultural and linguistic groups. Most standard tests and other forms of assessment presently in use in the school are inappropriate for children who do not belong to the American mainstream middle-class. Equally important are the negative aspects of the commonly used techniques of testing. The idea of being tested by an examiner from a different cultural background and primary language can be both physically and psychologically frightening, and produce profound effects on the results of the testing.

Testing and assessment techniques are affected either positively or negatively by the test atmosphere, bias of the examiner, and attitudes of both the tester and the person being tested. If assessment of children is to continue in the schools, even with new and better instruments, the interpersonal dynamics of those being tested and those giving tests must be understood.

Because assessment is such an integral and necessary part of any research study, Panel 9 gave highest priority to this area of research as a basis for all other research recommended by the panel. The types of research issues they identified were:

- What are the major assessment instruments and techniques popularly used to evaluate reading skills? How appropriate, useful and effective are they for use with children of different cultural and ethnic groups?
- What assessment instruments are available or could be developed to measure important characteristics of children with different cultural and linguistic backgrounds, e.g., learning styles?
- What assessment instruments are available or could be developed to measure characteristics of the learning environment or instruction that are potentially important to teaching children of different cultural and linguistic groups, e.g., teaching styles, and community participation?
- What factors in the testing situation, e.g., examiner bias, testing atmosphere, affect test results for the culturally and linguistically different child?

PANEL 10

essential skills and skill hierarchies in reading

In recent years the dominant approach to reading instruction has been that of teaching a set of specific reading skills. The complex behavior called "reading" has been viewed as consisting of a number of separate and identifiable behaviors, or skills, that teachers, materials designers, test designers, etc., can describe and around which they can organize instruction or evaluation.

This reading skills orientation has arisen from a number of simultaneous concerns in education. One such concern has been an increasing emphasis on "individualizing" instruction—an attempt to provide individually appropriate learning experiences to the variety of children in any one classroom. The skills orientation or division of the reading performance into small measurable parts allows the teacher to plan for and keep track of children's individual progress. Another educational concern has been increased attention to diagnosing learning strengths and difficulties followed by prescriptions of materials and techniques based on the diagnoses. Here again a skill based approach enables a teacher to diagnose specific measurable behaviors and plan around the competencies a child does or does not yet have.

In the area of testing and evaluation, a growing dissatisfaction with test results that merely compare children to each other (norm-references) and tell the teacher little about the performance of the child has led to searching for alternative measures. With a skills orientation, assessment tools are being developed that determine whether or not a student has a designated set of skills (criterion-referenced). Such assessment tools can indicate for the teacher a student's strengths and areas of needed instruction.

Given the popularity and emphasis on a skill-based approach to reading, a number of the assumptions underlying this viewpoint need to be tested. First of all is the assumption that "essential" skills do exist and that these skills can be taught. Since there exists no single validated list of "essential" skills, the many reading programs vary considerably in the skills emphasized as important for instruction. A second assumption—not commonly stated and yet untested—is that skills are ordered in some type of sequence or hierarchy. Most skill approaches to reading go even further by assuming that mastery of subskills is dependent upon prior mastery of other subskills. A third and also untested assumption is that teaching by a skill-based approach is effective and efficient in teaching reading.

Panel 10 recommended research around the first two of these assumptions. The panel's efforts were directed at identifying research that would help validate the existence of essential skills and skill hierarchies and help determine whether or not they are teachable.

Identification of Essential Skills

A wide variety of reading programs include lists of reading skills thought to be necessary in learning to read. Although the lists now in use contain a wealth of information well worth tapping, we have not yet compiled, compared and organized the variety of listings for optimal use. We also cannot assume that current reading programs have identified the complete set of essential skills for reading. This is especially true in the areas of beginning reading and reading comprehension.

Panel 10 recommended research that would identify a comprehensive set of skills considered to be "candidates" for essential skills. This would be followed by research designed to determine whether or

not each skill is, in fact, essential. The validating of a skill as an essential skill would involve looking at the relationship between demonstrating the skill and acquisition of reading competence, i.e., more terminal reading behaviors in a skill hierarchy.

Acquisition of Essential Skills

It is not enough to have identified and validated essential skills. In order to continue building the body of information needed to design efficient and effective teaching approaches, we need to understand the factors that influence the acquiring of such skills. Visual, auditory and cognitive skills likely play a significant role in the process of learning to read.

Researchers have devoted considerable effort to investigating visual-perceptual skills and how they develop. They have collected much evidence that correlates certain visual skills with reading competence. Similarly, in the area of auditory skill development, it has been demonstrated that children who are having difficulty in beginning reading very often are unable to perform well on auditory tasks such as breaking down the combination of sounds in a word, or blending sounds to create words when reading. Panel 10 recommended research to explore the relationships between visual and auditory skill development and the acquisition of reading skills.

A major goal of reading instruction by the skill-based approach is the eventual development of reading comprehension abilities. Little is known about the cognitive skills that may underly and lead to comprehension competence. The panel suggested research relating the development of children's logical thinking (cognitive skills) and the process of learning to comprehend while reading.

Hierarchies of Skills

Most of the listings of essential skills existing in curriculum guides, in manuals of reading programs, and in skill-based reading materials are commonly organized in some type of hierarchy or sequential order. The major weakness in the hierarchies chosen is that they have not been validated or empirically derived. After having broken down a complex skill into separate component skills, hierarchies most often represent "best guesses" at an ordinal structuring, or are based on some other logical (non-empirical) analysis of reading. In only rare instances have the hierarchies been based on some type of model or theory of reading comprehension.

Because a primary reason for so few hierarchies based on a model or theory has been inadequacies in methods we now have available, Panel 10 recommended that studies be devoted to research methodology. The fundamental research questions would be: *How* can we validate a hierarchy of skills? What procedures or techniques would tell us with any degree of certainty that one skill is essential to and leads to another or others? What would be adequate evidence?

A logical and recommended extension of such research would be to determine whether different sets and arrangements of skills are more or less appropriate for different groupings of children. Different groupings of children might be, for example, non-English-speaking children, children at varying levels of cognitive development, children with different styles of thinking, or children having an auditory, visual or kinesthetic preference for learning. The recommended research would explore whether or not, and how, skill hierarchies might be tailored to fit specific types of children.